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Project Status Report

Upper Mississippi River
Long Term Resource Monitoring Program
U.S. Geological Survey

Vegetation Response to a Water Level Experiment¹

The Saint Louis District, U.S. Army Corps of Engineers (COE), has been experimenting with water levels on Pools 24, 25, and 26 since 1994. The experiment is being performed in cooperation with the Pool 25 Natural Resources Management Committee, an interagency group dedicated to improving habitat in the Upper Mississippi River floodplain. The experiment was thought to be successful in 1994 although little quantitative data were obtained. The COE agreed

to continue the experiment if discharge was within the proper range during 1995, with vegetative response monitoring being performed by the Missouri Department of Conservation and the Environmental Management Technical Center.

All three pools were managed to improve vegetative production. Recommendations from the Committee called for holding water levels on the low side of the operating band for at

least 30 days during late spring or summer. After this period the pool would be raised at a rate not greater than 0.2 ft per day.

All three navigation pools within the St. Louis District were closely regulated to provide a drawdown for vegetative growth, as well as to provide a safe and dependable navigation channel. An example of water levels during the summer of 1995 is shown for Pool 25 (Figure 1). The horizontal line at 434 ft represents the water elevation normally maintained. High discharges as a result of the Flood of 1995 dropped in early June to a range where water levels could be managed by the dams. Starting in mid-June, water levels were held at least 2 ft lower than the project pool elevation until mid-July. Water levels were then gradually raised until mid-August. Higher discharges at that time necessitated lowering water levels at the dam for another month.

Twenty vegetation surveys were performed at 8 areas: Crider Island, Pharrs Island and Clarksville Refuge in Pool 24; Stag Island, Jim Crow Island, Turner Island and Batchtown in Pool 25; and Dresser Island in Pool 26. Three points were established at each of the 20 sites, each with an elevation difference of 0.5 ft. At each point, a 0.5m quadrate was estab-

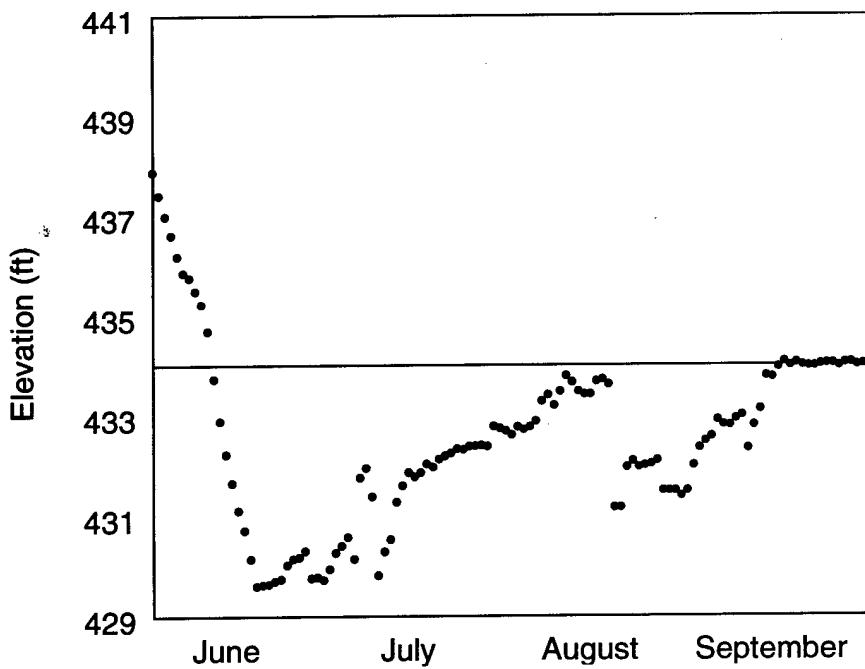


Figure 1. Water levels just upriver of Dam 25 during the summer of 1995.

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lished to record plant species and the number and height of individuals. In addition, photographs were taken at each site during weekly visits. Seven plant genera were identified in the 20 survey sites: Polygonum spp. (Smartweed, found at 45 % of the sites); Cyperus spp. (Chufa, 75%); Echinochloa spp. (Wild Millet, 80%); Amaranthus spp. (Pigweed, 30%); Setaria spp. (Yellow Foxtail, 10%); Panicum (15%); and, Leersia (Rice Cutgrass, 20%).

Approximately 30 days were required for plants to grow to a height of 7-10 inches during the summer of 1995. Plants then grew more quickly as water levels were slowly raised. Of the three dominant plants, Chufa reached a height of 35 inches during the last sampling period, while Wild Millet and Smartweed were approximately 40-45 inches at that time.

We obtained aerial infrared photographs (1:15,000 scale) on July 27, 1995, for the lower stretches of the three pools where water levels were held lower than normal and for Pool 22 where no drawdown occurred. These photographs were interpreted using the standard Long Term Resource Monitoring Program vegetation classification system, specifically searching areas near the water line that had signatures representing the above plants. The estimate of plants from photo interpretation for eight-mile stretches just upriver of the dams is shown in figure 2. In Pools 24 through 26, between 255 and 880 acres of plants were measured near the water line compared to just 51 acres in Pool

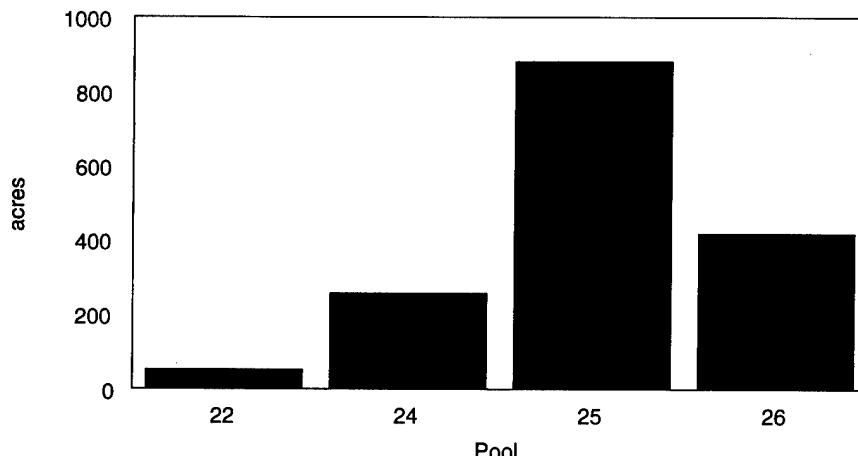


Figure 2. The amount (acres) of emergent vegetation estimated from photo interpretation.

22, which was not managed to provide additional vegetative growth. The acreage figures may be underestimated because vegetation swaths under 2 m wide were generally not included.

The environmental pool management experiment conducted by the COE in conjunction with the Pool 25 Natural Resources Management Committee is an example of how environmental and navigation goals can be met. The authors believe that this coordinated water level management experiment represents a step toward ecosystem management on the Upper Mississippi River System.

For their part in the experiment, the St. Louis District won the 1997 Mississippi River Restoration award presented by American Rivers, a national river conservation group based in Washington, D. C. □

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